

REMARKS/ARGUMENTS

Upon entry of this reply, claims 1, 17, 18, 20, 21, 23, 25, 27 and 29 will be amended, claim 6 will be canceled, and claims 30-34 will be added, whereby claims 1-5 and 7-34 will be pending. Claims 1, 17, 18, 20, 21, 31, 32 and 33 are independent claims.

Applicants note that claims 1, 18 and 21 have been amended to include allowable subject matter as indicated in the Office Action, at paragraph 7. Therefore, these claims and the claims dependent therefrom should be in condition for allowance. Moreover, non-elected claims 17 and 20 are amended to include the allowable subject matter. Therefore, these claims should also be indicated to be allowable over the prior art of record.

Claims 23, 25, 27 and 29 have been amended to avoid claim redundancy by including that the isotropic magnetically soft pigment has a specific surface area determined on the basis of BET method of more than 120 m²/g. Applicants further note that support for this disclosure appears in Applicants' originally filed application, including paragraph [0057] of the originally filed specification.

Still further, claim 30 has been added, which claim is similar to originally presented claim 7. Moreover, claims 31 and 32 have been added which include the subject matter of originally presented claims 1 and 18, and further define that the isotropic magnetically soft pigment has a specific surface area determined on the basis of BET method of more than 120 m²/g.

Reconsideration and allowance of the application are respectfully requested.

Initialed Copy Of Form PTO-1449

Applicants express appreciation for the inclusion in the Office Action of an initialed copy of the Form PTO-1449 whereby the Examiner' consideration of Applicants' Information Disclosure Statement and each of the documents cited therein is of record.

Response To Maintaining Of The Restriction Requirement

Applicants note that claims 17, 20, 24 and 25 stand withdrawn from consideration. Applicants respectfully request rejoinder of the non-elected claims upon allowance of the elected group of invention.

Response To Claim Objections

In response to the objection of claims 23, 27 and 29 for being redundant, Applicants have amended to claims (including dependent claim 25) to remove the claim redundancy as noted above. Accordingly, this ground of objection should be withdrawn.

Prior Art Rejections

The following rejections are set forth in the Official Action:

(a) Claims 1-3, 5, 12, 15, 18, 19, 21, 22, 26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Munch et al., U.S. Patent No. 5,641,355 (hereinafter "Munch") in view of Inoue et al., U.S. Patent No. 5,989,703 (hereinafter "Inoue").

(b) Claims 4, 8-11 and 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Munch, U.S. Patent No. 5,641,355, in view of Inoue., U.S. Patent No. 5,989,703, and Yamazaki et al. (hereinafter “Yamazaki”).

In response to the rejections of record, Applicants note the following:

As noted above, independent claims 1, 18 and 21 as well as non-elected independent claims 17 and 20 have been amended to include the allowable subject matter indicated in the Office Action. Therefore, these claims and the claims dependent therefrom should be in condition for allowance. Thus, claims should be indicated to be allowable over the prior art of record.

Moreover, Applicants’ invention as recited in independent claim 31 is directed to a multilayer magnetic recording medium which comprises, on a nonmagnetic substrate, at least one upper binder-containing magnetic recording layer which has a thickness of less than 0.5 µm and contains finely divided magnetic pigment having a coercive force H_c of 100 – 250 kA/m, at least one lower binder-containing layer which contains an isotropic magnetically soft pigment which is selected from γ -Fe₂O₃, Fe₃O₄ or a solid solution of these components and has a mean crystallite size of less than 10 nm, and the isotropic magnetically soft pigment has a specific surface area determined on the basis of BET method of more than 120 m²/g.

Still further, Applicants’ invention as recited in independent claim 32 is directed to a magnetic recording medium containing an upper layer, and a lower layer, said lower layer including magnetically soft pigment which is selected from γ - Fe₂O₃, Fe₃O₄ and a solid solution of these components and has a mean crystallite size of less than 10 nm, and the isotropic

magnetically soft pigment has a specific surface area determined on the basis of BET method of more than 120 m²/g.

Still, further Applicants' independent claim 33 is directed to a magnetic tape, magnetic card or floppy disk comprising a multilayer magnetic recording medium which comprises, on a nonmagnetic substrate, at least one upper binder-containing magnetic recording layer which has a thickness of less than 0.5 µm and contains a finely divided magnetic pigment having a coercive force H_c of 100 – 250 kA/m, and at least one lower binder-containing layer which contains an isotropic magnetically soft pigment which is selected from γ -Fe₂O₃, Fe₃O₄ or a solid solution of these components and has a mean crystallite size of less than 10 nm, and the isotropic magnetically soft pigment has a specific surface area determined on the basis of BET method of more than 120 m²/g.

Thus, amongst other features recited in Applicants' independent claims 31-33, Applicants' claims 31-33 include that the isotropic magnetically soft pigment has a specific surface area determined on the basis of BET method of more than 120 m²/g. In contrast, the magnetic recording medium of Inoue includes as an essential feature iron oxide magnetic powder having small crystallite and a small specific surface area, being equal to or small than 30 m²/g. In this regard, the Examiner attention is directed to Inoue, at column 2, lines 22-26, and the abstract wherein it is disclosed that the iron oxide magnetic powder according to the invention of Inoue contains crystallite having size of 30 nm or less when measured by an X-ray diffraction method and a specific surface area of 30 m²/g or less when measured by a BET method. IN contrast, the present invention as recited in independent claims 31-33 includes, amongst other

features, that the lower layer includes an isotropic magnetically soft pigment having a specific surface area determined on the basis of BET method of more than 120 m²/g.

As disclosed in Applicants' originally filed specification, in paragraph [0057]:

By means of the very finely divided character of the pigment, its specific surface area (SSA) is increased. This specific surface area determined on the basis of the BET method is more than 100, in particular more than 120, m²/g. This contributes toward greater porosity in the lower layer. Through the adsorption on the large surface area of the magnetically soft pigments and through the greater pore volume in the lower layer, a larger amount of lubricants can be taken up in the lower layer in comparison with particles having a larger particle size, the layer thickness being identical. The amount of lubricant can gradually be released to the upper layer during a long period of use of the magnetic recording medium and thus keeps the coefficients of friction of the magnetic layer low even with prolonged operation of the medium. The absorption of more than 6, preferably more than 7, % by weight, based on the total weight of the pigments in the lower layer, of lubricants can thus be achieved.

Thus, Applicants' invention is capable of achieving greater porosity in the lower layer. This permits a larger amount of lubricants to be taken up in the lower layer in comparison with particles having a larger particle size. The amount of lubricant can gradually be released to the upper layer during a long period of use of the magnetic recording medium and thus keeps the coefficients of friction of the magnetic layer low even with prolonged operation of the medium. Neither Inoue nor Munch teaches or suggests Applicants' disclosed and claimed invention nor the benefits associated therewith.

The advantages of Applicants' invention including such multilayered magnetic recording medium comprising a lower layer including an isotropic magnetically soft pigment having a specific surface area determined on the basis of BET method of more than 120 m²/g can also

been seen from Applicants' Examples 3 and 4 in the specification. Example 3 shows that the lower layer is capable of taking up a larger amount of lubricant and illustrates the advantages observed with a lower layer including an isotropic magnetically soft pigment having a specific surface area determined on the basis of BET method of more than 120 m²/g.

Still further, while not being necessary to further establish patentability over any combination of the documents utilized in the rejection, and to assist the Examiner's understanding of Applicants' invention, Applicants note that the lower layer pigment has a BET m²/g of 240 for type a lower layer pigment, of 267 for type b lower layer pigment, 218 for type c + Fe₂O₃ lower layer pigment, 100 for type d lower layer pigment, 83 for type e or f lower layer pigment, and 104 for type g lower layer pigment. Thus, the lower layer including an isotropic magnetically soft pigment having a specific surface area determined on the basis of BET method of more than 120 m²/g permits the production of magnetic recording media with improved surface roughness and RF levels. If for any reason the Examiner deems that this information be in Declaration form, the Examiner is requested to contact the undersigned by telephone to discuss the same.

Still further, Applicants once again note that Applicants' invention provides a multilayer magnetic recording medium for high recording densities, which recording medium contains a magnetic pigment having a high coercive force in the upper magnetic layer and magnetically soft pigments in the lower layer and has excellent electromagnetic recording properties, in particular a high RF layer.

Applicants note that the differences between the documents utilized in the rejection of record and Applicants' invention have been presented in their previously filed Amendment on October 30, 2004. Therefore, for the sake of brevity, arguments relating to the various aspects of Applicants' invention are not being repeated herein, and the Examiner is referred to these previous arguments. However, Applicants note that no combination of the documents utilized in the rejections, i.e., no combination of Munch, Inoue and/or Yamazaki, teaches or suggests Applicants disclosed and claimed invention including, amongst other features, that the isotropic magnetically soft pigment has a specific surface area determined on the basis of BET method of more than 120 m²/g. For example, and as previously noted by Applicants, there is no teaching or suggestion in Inoue of having a crystallite size of less than 10 nm. All that Inoue discloses is the production of powders of a crystallite size of 17 nm or greater, and that such powders have a specific surface area of 30 M²/g or less when measured by a BET method. Thus, even if Munch, Inoue and/or Yamazaki are combined, the presently claimed invention would not be present. However, for the reasons previously advanced by Applicants, there is no motivation within the documents utilized in the rejections to combine their disclosures in the manner set forth in the rejection.

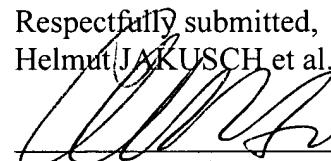
For the reasons set forth above, Applicants' disclosed and claimed invention are not taught or suggested by the prior art, whereby the claims are patentable over the prior art of record, and the rejections should be withdrawn.

CONCLUSION

In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw the rejections of record, and allow each of the pending claims.

Applicants therefore respectfully request that an early indication of allowance of the application be indicated by the mailing of the Notices of Allowance and Allowability.

Should the Examiner have any questions regarding this application, the Examiner is invited to contact the undersigned at the below-listed telephone number.

Respectfully submitted,
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